

- 1. An external defibrillator comprising defibrillator electrodes, and a piezoelectric polymer pulse sensor.
- 2. The external defibrillator of claim 1 further comprising instrumentation for performing an ECG analysis.
- 3. The external defibrillator of claim 1 further comprising instrumentation for analyzing a signal obtained from the pulse sensor.
  - 4. The external defibrillator of claim 1 wherein said pulse sensor is self-shielded.
- 5. The external defibrillator of claim 1 further comprising a strap for attaching said pulse sensor to a patient's neck.
- 6. The external defibrillator of claim 1 wherein said piezoelectric pulse sensor is mounted on one of said defibrillator electrodes.
- 7. The external defibrillator of claim 1 further comprising a display constructed to display information to a user.
- 8. The external defibrillator of claim 7 further comprising instrumentation for performing an ECG analysis, instrumentation for analyzing a signal obtained from the pulse sensor, and instrumentation for converting the results of the ECG analysis and signal analysis into a message to be displayed to the user or provided as an auditory prompt.
  - 9. A medical device comprising a piezoelectric polymer pulse sensor; and a strap constructed to allow the pulse sensor to be attached to a patient's neck.

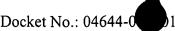
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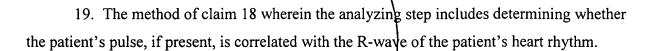
- 10. The medical device of claim 9 wherein the pulse sensor is self-shielded.
- 11. The medical device of claim 9 wherein the strap comprises an elastic material.
- 12. The medical device of claim 9 further comprising a cable to connect the pulse sensor to instrumentation.
  - 13. A medical device comprising
  - a piezoelectric polymer pulse sensor, and
- a foam pad having a first surface to which the pulse sensor is attached, and a second surface constructed to be attached to a patient.
- 14. The medical device of claim 13 wherein the second surface includes a layer of pressure-sensitive adhesive.

15. A method of treating a patient showing signs of possible cardiac arrest

applying a piezoelectric pulse sensor to the patient; applying electrodes of a defibrillator to the patient; and using the pulse sensor to detect whether the patient has a pulse.

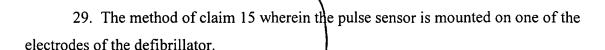
- 16. The method of claim 15 further comprising monitoring the pulse if present.
- 17. The method of claim 15 wherein the defibrillator has an ECG function and the method further comprises using the ECG function of the defibrillator to monitor the patient's heart rhythm.
- 18. The method of claim 15 further comprising analyzing the pulse and heart rhythm to determine the appropriate treatment for the patient.





- 20. The method of claim 19 wherein, if the determination is positive, no ECG analysis is performed.
- 21. The method of claim 18 wherein the analyzing step includes determining whether the ECG rhythm is treatable with defibrillation.
- 22. The method of claim 21 further comprising, if the determination is positive, delivering a shock to the patient using the defibril ator.
- 23. The method of claim 22 further comprising delivering a predetermined number of shocks to the patient, and then subsequently determining whether the patient's pulse, if present, is correlated with the R-wave of the patient's heart rhythm.
- 24. The method of claim 23 further comprising, if the subsequent determination is negative, administering CPR to the patient.
- 25. The method of claim 24 further comprising using the pulse sensor to determine the efficacy of the CPR treatment.
- 26. The method of claim 15 wherein the pulse sensor comprises a piezoelectric polymer film.
  - 27. The method of claim 15 wherein the pulse sensor is mounted on an elastic strap.
- 28. The method of claim 27 further comprising attaching the elastic strap around the patient's neck.





- 30. The method of claim 15 wherein the pulse sensor further comprises a foam layer.
- 31. The method of claim 15 wherein the pulse sensor is self-shielded.
- 32. The method of claim 15 further comprising attaching the pulse sensor to a patient using a clip, patch or suction device.
- 33. The method of claim 32 wherein the pulse sensor is attached to the patient's neck.
- 34. The method of claim 32 wherein the pulse sensor is attached to a pulse point other than on the patient's neck.
- 35. A method of treating a patient showing signs of possible cardiac arrest comprising:

applying a piezoelectric/pulse sensor to the patient;

using the pulse sensor fo detect whether the patient has a pulse; and

using the pulse sensor to determine whether to apply electrodes of a defibrillator to the patient.

36. A method of treating a patient showing signs of possible cardiac arrest comprising:

applying a piezoelectric pulse sensor to the patient; using the pulse sensor to detect whether the patient has a pulse; and using the pulse sensor to determine whether to perform CPR on the patient.

37. The external defibrillator of claim 1 further comprising a clip, patch or suction device constructed to attach the pulse sensor to a patient.

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38. The external defibrillator of claim 1 wherein said external defibrillator comprises an automated defibrillator.